ZOOLOGIA 38: e63051
ISSN 1984-4689 (online)
zoologia.pensoft.net

RESEARCH ARTICLE

Review of *Strongylogaster* Dahlbom (Hymenoptera: Tenthredinidae) from Zhejiang Province, China, with the description of a new species

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http://zoobank.org/FBC57334-70AB-4839-9C86-3D8E0CF08990

ABSTRACT. Five species of *Strongylogaster* Dahlbom, 1835 are recorded from Zhejiang Province, China. They are four known species, *S. formosana* (Rohwer, 1916), *S. macula* (Klug, 1817), *S. takeuchii* Naito, 1980 and *S. xanthocera* (Stephens, 1835), and a new species. *Strongylogaster tianmunica* **sp. nov.**, collected from Mt. Tianmu in Zhejiang Province, is here described and illustrated. This new species resembles *S. nantouensis* Naito, 1990, but differs from the latter by the following characters: female body length 10–12 mm, male body length 8–10 mm; tegula brown to dark brown; pronotum largely yellowish-white; trochanters black, apical half of hind femora and of hind tibiae yellowish-white; malar space as long as radius of median ocellus; antennomere 3 as long as antennomere 4; and ovipositor apical sheath with distinct lateral scapes. A key to the five species of *Strongylogaster* from Zhejiang Province is provided.

KEY WORDS. Sawflies, Selandriinae, taxonomy, Tenthredinoidea.

INTRODUCTION

Strongylogaster Dahlbom, 1835 is the largest genus in Selandriinae (Taeger et al. 2010), which occurs in the Palaearctic, Nearctic, and Oriental regions (Wei and Nie 1998). Forty-four previously known species have been recorded worldwide (Taeger et al. 2010), of which 17 species have been recorded from China up to now according to the Electronic World Catalog of Symphyta (https://www.sdei.de/ecatsym/ecatsym.php).

The Tianmu mountain is located in Lin'an District of Hangzhou City, Zhejiang Province, being one of the famous mountains in East China. As a result of three field trips conducted in May and June, 2014 and 2019, we collected a total of 107 specimens of *Strongylogaster*. Five species were identified and one of them is new to science. The results, including diagnoses, a key, and the description of the new species, are reported herein.

MATERIAL AND METHODS

Specimens studied in this work were collected by sweeping in wooded bog and forest fringe zones in the forest ecosystem of the middle subtropical zone in China. Of the new species, 68 specimens were examined. Names of the mentioned host plants follow the Flora Reipublicae Popularis Sinicae (http://www.iplant.cn/frps). Unless otherwise stated, species distribution data at the level of zoogeographic regions is taken from Wei et al. (unpublished data). The specimens were examined with a Motic-SMZ-171 stereomicroscope. Images of adults were taken with a Nikon D700 digital camera and a Leica Z16APO device. The genitalia were examined with a Motic BA410E microscope and photographed with a Motic Moticam Pro 285A. Images were focus-stacked using Helicon Focus (HeliconSoft, Kharkiv, Ukraine) and further processed with Adobe Photoshop CS 11.0. The terminology of genitalia follows Ross (1945) and that of general morphology follows Viitasaari (2002). For a few terms (e.g., middle fovea and lateral fovea), we follow Takeuchi (1952).

The holotype and part of the paratypes are deposited in the Asian Sawfly Museum, Nanchang, China (ASMN). The remaining paratypes are deposited in the Scientific Research and Management Center of East China Pharmaceutical Botanical Garden, Lishui, Zhejiang, China (formerly Lishui Academy of Forestry, LSAF).

Abbreviations. (OOCL) distance between the lateral ocellus and the occipital carina or the hind margin of the

head; (OOL) shortest distance between the compound eye and the lateral ocellus; (POL) distance between the margins of the lateral ocelli.

TAXONOMY

Strongylogaster Dahlbom, 1835

Diagnosis. Body and wings long. Clypeus short, anterior margin slightly emarginated; eyes large and elliptical, distance between eyes usually broader than length of eye; mandibles stubby, with 2–3 symmetrical teeth, apical tooth weakly curved; temple short, lateral sides narrowed in dorsal view, postocellar area broader than long, hind orbit rounded, occipital carina short or absent; frons conspicuous, with a distinct frontal ridge; malar space 0.3–1.3 times diameter of median ocellus; antennae stout, antennomere 2 broader than long, antennomere 3 approximately as long as antennomere 4; epicnemium narrow, distinctly elevated, epicnemial groove distinct; mesepimeron with a distinct transverse middle carina, lower part of anepimeron concave; apex of inner spur of fore tibia bifid, metabasitarsus much shorter than following four tarsomeres together; tarsal claw without basal lobe, inner tooth absent or small and remote from outer tooth; fore wing with vein 1M weakly convergent or parallel with 1m-cu towards pterostigma, base of vein Rs+M distinctly curved, vein cu-a joining cell 1M at about middle, cell 2M clearly longer than broad, anal cross-vein usually absent; hind wing with cells Rs and M closed, anal cell sessile or with a short petiole; ovipositor sheath usually with lateral branches or scapes, narrow and long in few species; lamnium of lancet longer than radix, mostly with regular serrulae; valviceps of penis valve long oval, dorsal margin with minute teeth.

Remarks. *Strongylogaster* is morphologically similar to *Thrinax* Konow, 1885, but it can be distinguished by the following characters: epicnemium distinctly elevated, epicnemial groove broad and deep; anepimeron without a membranous area; frontal ridge low and obtuse; occipital carina absent; the anal cell of fore wing usually without a cross-vein; ovipositor sheath usually with lateral branches or scopas. *Thrinax* can be differentiated by the following features: epicnemium flat, epicnemial groove suture-like or vestigial; anepimeron usually with a distinct membranous area; the frontal ridge distinctly raised, occipital carina well defined on lower hind margins; anal cell of fore wing with a suberect cross-vein, saw sheath always simple and slender towards apex. At present, 44 previously known species have been recorded worldwide. Among them, 17 species occur in China based on *Strongylogaster* specimens available in our lab (ASMN).

Key to species of *Strongylogaster* Dahlbom, 1835 from Zhejiang Province, China

1. Clypeus black; hind anal cell sessile; claw with inner tooth; female apical sheath with divergent lateral scopas; body length 10–12mm 2

1′. Clypeus white; hind anal cell distinctly petiolate; claw without inner tooth; female apical sheath with short lateral branches; body length 6–8mm 3

2. Claw with a large inner tooth; head rugose, mesonotum and mesepisternum densely punctate, without smooth area; broad posterior band on abdominal tergites 2–8 yellowish-white; pterostigma partly yellowish-brown; ovipositor apical sheath with very large lateral scopas ..... *S. xanthocera* (Stephens, 1835)

2′. Claw with a minute inner tooth; head largely smooth, mesonotum and mesepisternum smooth and shiny, impunctate; narrow posterior margin of abdominal tergites 2–6 brown; pterostigma entirely black; ovipositor apical sheath with small lateral scopas ..... *S. tianmunica* sp. nov.

3. Mesepisternum strongly shiny, surface very smooth, without punctures or microsculptures; narrow posterior margins of abdominal terga yellowish-white 4

3′. Mesepisternum feebly shiny, surface with dense and minute punctures mixed with microsculptures; several middle terga largely yellowish-brown to reddish-brown ..... *S. macula* (Klug, 1817)

4. Middle fovea triangular in shape; inner orbits densely microsculptured; petiole of hind anal cell as long as breadth of anal cell ..... *S. takeuchii* Naito, 1980

4′. Middle fovea subquadrate in shape; upper inner orbits smooth and shiny; petiole of hind anal cell longer than breadth of anal cell ..... *S. formosana* (Rohwer, 1916)

Strongylogaster formosana (Rohwer, 1916)

Thrinax formosana Rohwer, 1916: 100.

Diagnosis. Female body length 6–7 mm; male body length 5–6 mm. Body black, following parts yellowish-brown: labrum, clypeus, posterior half of pronotum, posterior margins of all abdominal terga, tegula and legs; other parts of all abdominal terga black. Head, pronotum, all abdominal terga, posterior margin of mesepimeron and metapleuron with dense microsculptures, shiny. Malar space broader than diameter of middle ocellus; median fovea large and round, fine carina of lateral foveae high; postocellar area broad, lateral furrow deep and oval rounded; antennae long, approximately 3× length of breadth of head, antennomere 3 shorter than antennomeres 4 and 5. Claw without subapical tooth. Fore wing without anal cross-vein, vein 2r joining inner of vein 3r-m; petiole of anal cell in hind wing slightly shorter than breadth of anal cell. Ovipositor slightly short, scape branch shaped, divergent towards the back; cercus extending into sheath apex. Annuli of serrulae low and flat.

Material examined. 1 female and 1 male, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Nandamen, 30.30°N, 119.44°E, 380 m, 25-III-9-IV-2014, leg. Zejian LI & Lan YE, ethyl acetate (LSAF14009); 1 female and 4 males, China, Zhejiang Province, Lishui City, Mt. Baiyun, Ecology Forest Farm, Taishan Station, 28.536°N, 119.931°E, 965 m, 6-30-IV-2016, leg. Zejian LI & Hejun YE, alcohol (LSAF16063); 2 females, China, Zheji-

ang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 10-IV-2015, leg. Zejian LI, ethyl acetate (LSAF15028); 1 female, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 17-18-IV-2018, leg. Mengmeng LIU & Kaiwen GAO & Tingting JI, ethyl acetate (LSAF18028); 1 male, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Kaishanlaodian, 30.343°N, 119.433°E, 1106 m, 5-IV-2015, leg. Zejian Li, ahcohol (LSAF15022); 2 females, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 5-6-IV-2015, leg. Zejian LI & Tao LI, KCN (LSAF15025); 2 females, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 12-IV-2015, leg. Zejian Li, ethyl acetate (LSAF15029); 2 females, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.30°N, 119.44°E, 380 m, 25-III-9-IV-2014, leg. Zejian LI & Lan YE, ethyl acetate (LSAF14009) 1 female, China, Zhejiang Province, collection details missing (LSAF15001).

Distribution. China (Fujian, Guangxi, Hunan, Jiangxi, Taiwan, Zhejiang).

Host plants. Unknown.

Strongylogaster macula (Klug, 1817)

Tenthredo (*Allantus*) *macula* Klug, 1817: 217.
Thrinax intermedia Konow, 1885: 23.

Diagnosis. Female body length 5–7 mm. Body black, following parts yellowish-brown: labrum, clypeus, posterior half of pronotum, tegula and legs; median parts of all abdominal terga with yellowish-brown maculae of various shapes, basal and apical parts black. Head, lateral sides of median mesoscutal lobe, pronotum, all abdominal terga, mesepimeron and metapleuron with dense microsculptures, those of head slightly rugose, frontal area and lateral parts with lustre, mesepisternum with small punctures, interspace between punctures slightly smooth. Malar space broader than diameter of middle ocellus; median fovea large and round, fine carina of lateral foveae high; postocellar area broad, lateral furrow deep and oval rounded; antennae long, approximately 3× slightly shorter than breadth of head, antennomere 3 shorter than antennomeres 4 and 5. Claw without subapical tooth. Fore wing without anal cross-vein, vein 2r joining inner of vein 3r-m; petiole of anal cell in hind wing slightly shorter than breadth of anal cell. Ovipositor slightly short, scape branch shaped, divergent towards the back; cercus extending into sheath apex. Annuli of serrulae low and flat.

Material examined. 1 male, China, Zhejiang Province, Lin'an District, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 8-IV-2017, leg. Zejian LI & Mengmeng LIU, ethyl acetate (LSAF17027); 4 males, China, Zhejiang Province, Longquan City, Mt. Fengyang, 24-26-IV-2018, leg. Zejian LI & Mengmeng LIU & Tingting JI, ethyl acetate (LSAF18034); 6 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.322°N, 119.443°E, 362 m, 5-IV-2019, leg. Zejian LI & Xiufang LI, ethyl acetate (LSAF19007); 1 female and 1 male, China, Zhejiang Province, Lishui City, Liandu District, Fengyuan Town, 28.195°N, 119.797°E, 1000 m, 22-IV-2019, leg. Zejian LI, ethyl acetate (LSAF19015).

Distribution. China (Anhui, Chongqing, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Zhejiang), Europe, Japan, North America.

Host plant. *Athyrium filix-femina* (L.) Roth (Athyriaceae), *Pteridium aquilinum* (L.) Kuhn (Pteridaceae) (Liston 1995).

Strongylogaster takeuchii Naito, 1980

Strongylogaster takeuchii Naito, 1980: 392.

Diagnosis. Female body length 6 mm. Body black, following parts white: labrum, clypeus, posterior margin of pronotum, tegula, median parts, posterior margins and lateral sides of abdominal terga; legs yellowish-brown, basal half of all coxae, dorsal sides of middle tarsomeres, dorsal sides of hind tibiae and hind tarsomeres blackish-brown. Dorsal side of head with dense microsculptures, frontal area smooth; thorax smooth, pronotum, posterior parts of mesopleuron and metapleuron with fine microsculptures, posterior margin of mesoscutellum with some punctures; all abdominal terga with dense microsculptures. Median fovea triangular, lateral foveae as broad as median fovea, oval rounded, dorsal margin with fine carina; frontal ridge acute, frontal area five-pointed; lateral furrow of postocellar area deep and oval; malar space as long as diameter of middle ocellus; antennae 3× length of breadth of head, antennomere 3 clearly shorter than antennomere 4. Claw without subapical tooth. Petiole of anal cell of hind wing as long as breadth of anal cell. Ovipositor sheath in dorsal view as long as cercus, scape branch shaped, slightly parallel. Annuli of serrulae slightly prominent.

Material examined. 2 females and 3 males, Mt. Tianmu, Zhejiang, no collecting time (Zhejiang Agriculture University).

Distribution. China (Shaanxi, Zhejiang), Japan.

Host plants. Unknown.

Strongylogaster tianmunica sp. nov.

Figs 1–16

http://zoobank.org/F7E63E9D-CEEE-4D40-9F9B-CB229F34DF4E

Type locality. China, Zhejiang, Lin'an District, Mt. Tianmu.

Diagnosis. This new species resembles *S. nantouensis* Naito, 1990, but differs from the latter by the following characters: female body length 10–12 mm, male body length 8–10 mm; tegula brown to dark brown; pronotum largely-yellowish white; trochanters black, apical half of hind femur and of hind tibia yellowish-white; malar space as long as radius of median ocellus; antennomere 3 as long as antennomere 4; and ovipositor apical sheath with distinct lateral scapes.

Type material. Female holotype, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 15-IV-2016, leg. Zejian LI & Mengmeng LIU & Zhiwei CHEN, ethyl acetate (LSAF16144, ASMN). Paratypes, 5 females and 5 males, same data as holotype (LSAF16144); 1

female and 6 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 12-IV-2015, leg. Zejian LI, ethyl acetate (LSAF15029); 3 females and 3 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 13-IV-2016, leg. Zejian LI & Mengmeng LIU & Zhiwei CHEN, ethyl acetate (LSAF16141); 1 female and 3 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 8-IV-2017, leg. Kaiwen GAO & Tingting JI, ethyl acetate (LSAF17028); 1 female and 2 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 3-IV-2018, leg. Zejian LI & Mengmeng LIU & Kaiwen GAO & Tingting JI, ethyl acetate (LSAF18012); 2 females and 6 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 8-IV-2018, leg. Tingting JI, ethyl acetate (LSAF18019); 1 female and 2 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 11-IV-2018, leg. Tingting JI, ethyl acetate (LSAF18025); 1 female and 1 male, China: Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 17-18-IV-2018, leg. Mengmeng LIU & Kaiwen GAO & Tingting JI, ethyl acetate (LSAF18028); 2 females, China: Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 17-IV-2016, leg. Zejian LI & Mengmeng LIU & Zhiwei CHEN, ethyl acetate (LSAF16146); 1 female, China: Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 8-IV-2017, leg. Zejian LI & Mengmeng LIU, ethyl acetate (LSAF17027); 1 male, China: Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 6-IV-2017, leg. Kaiwen GAO & Tingting JI, ethyl acetate (LSAF17025); 1 male, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 6-IV-2017, leg. Zejian LI & Mengmeng LIU, ethyl acetate (LSAF17024); 2 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 11-12-IV-2017, leg. Tingting JI, ethyl acetate (LSAF17029); 3 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.322°N, 119.443°E, 362 m, 5-IV-2019, leg. Zejian LI & Xiufang LI, ethyl acetate (LSAF19007); 9 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.322°N, 119.443°E, 362 m, 7-8-IV-2019, leg. Zejian LI & Xiufang LI, ethyl acetate (LSAF19008); 1 female, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.322°N, 119.443°E, 362 m, 28-29-IV-2019, leg. Xiufang LI & Tingting JI, ethyl acetate (LSAF19018); 1 female, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.322°N, 119.443°E, 362 m, 1-2-V-2019, leg. Xiufang LI & Tingting JI, ethyl acetate (LSAF19019); 2 males, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Xianrending, 30.350°N, 119.424°E, 1506 m, 3-V-2019, leg. Zejian LI, ethyl acetate (LSAF19023); 1 male, China: Zhejiang Province, collection details missing (LSAF14008).

Description. Holotype, female (Figs 1, 3, 4, 6, 8, 9, 10, 11, 13, 14); paratype, male (Figs 2, 5, 7, 12, 15, 16). Body length 10–12 mm (Fig. 1).

Color. Body black; palp mostly blackish-brown; broad band on posterior margin and lateral corners of pronotum, yellowish-white; tegula, median blotch of abdominal tergum 1, narrow but distinct posterior margins of abdominal terga 1–8, narrow posterior margins of sternites 1–6, indistinct median carina and posterior margin of abdominal tergum 10, pale brown; apical margins of fore and middle coxae, apical 2/5 of hind coxa, about apical half of each femur and basal half of all tibiae, yellowish-white; apical half of fore tibia and tarsomeres, apical half of middle tibia, almost entire middle tarsomeres and base of metabasitarsus, brown; apical half of hind tibia and hind tarsus except base blackish-brown to black. Wings hyaline, apical third barely infuscate, basal 1/2 of vein C in fore wing and entire vein C in hind wing pale brown, other veins and stigma blackish-brown. Body hairs silver, hairs on sheath and antennae blackish-brown.

Punctuation. Dorsum of head largely smooth and impunctate, face and frons weakly sculptured mixed with some small punctures, shiny (Fig. 3); clypeus and supraclypeal area densely and coarsely punctured, less shiny (Fig. 4); mesonotum, mesoscutellum and appendage, mesepisternum and mesepimeron largely smooth, strongly shiny, posterior margin of mesoscutellum with a row of large punctures; metepisternum and margins of metepimeron finely microsculptured, without distinct punctures (Fig. 6); abdominal tergum 1 weakly microsculptured, other abdominal terga distinctly microsculptured.

Head. Clypeus flat, anterior margin shallowly incised to 1/6 length of clypeus; labrum small and short, transverse (Fig. 4); mandible short and broad, symmetrically bidentate; supraclypeal area slightly elevated; median fovea round and deep, lateral foveae broad and deep; frontal area faintly elevated, frontal crest slightly developed, interocellar furrow deep, punctiform, postocellar furrow fine but distinct, roundly bent forward; postocellar area elevated, approximately 2× broader than long, lateral furrow deep and broad, divergent backwards; lower third of hind orbit with low but distinct occipital carina; POL: OOL: OOCL = 40: 45: 30; malar space 0.6× breadth of diameter of middle ocellus (Fig. 3); inner margins of eyes slightly convergent downwards; head strongly narrowed behind eyes in dorsal view (Fig. 3). Antennae approximately 1.5× length of head and thorax (7: 4.6), approximately 0.9× length of abdomen (7: 8), approximately 2.8× length of breadth of head (7: 2.5), antennomere 3 about as long as antennomere 4, length ratio of antennomeres 5–9 41: 36: 34: 32: 29 (Fig. 11).

Wings (Fig. 1). Fore wing with R+M short, M straight, almost parallel to 1m-Cu, anal cell without anal cross-vein, cu-a joining cell 1M at middle, vein 2r joining cell 2Rs at apical 1/4, cell 2Rs longer than cell 1Rs; hind wing with cell Rs slightly shorter than cell M, anal cell sessile.

Legs. Apical spurs of hind tibia subequal in length, slightly longer than apical breadth of hind tibia, hind basitarsomere

Figures 1–16. *Strongylogaster tianmunica* sp. nov.: (1) female adult, dorsal view; (2) male adult, dorsal view; (3) head of female, dorsal view, (4) head of female, anterior view; (5) head of male, dorsal view; (6) mesopleuron and metapleuron of female; (7) subgenital plate, ventral side; (8) claw of hind leg; (9) ovipositor sheath, lateral view; (10) ovipositor sheath, dorsal view; (11) antenna of female, lateral view; (12) antenna of male, lateral view; (13) lancet; (14) apical half of lancet; (15) gonoforceps; (16) penis valve. Scale bars: 1, 2 = 2 mm; 15, 16 = 200 µm; 13, 14 = 100 µm.

much shorter than following 4 tarsomeres together (13: 16); claw with a minute inner tooth (Fig. 8).

Ovipositor sheath. Ovipositor sheath in lateral view as shown in Fig. 9 and in dorsal view as shown in Fig. 10, lateral scapes small but distinct, divergent backwards in dorsal view; lancet as shown in Fig. 13, distinctly tapering towards apex, apical half of lancet as in Fig. 14.

Male. Body length 8–10 mm (Fig. 2); color and structure similar to female except as follows: narrow posterior margin of abdominal terga 3–4 yellowish-brown; narrow posterior margin of terga 5–8 whitish; narrow apex of each coxa white; apical half of fore femur, apical third of middle femur and apical fifth of hind femur, fore and middle tibiae entirely and base of hind tibia, yellowish-brown; fore and middle tarsi pale brown at basal part and dark brown towards apex; hind tibia except for base and hind tarsus blackish-brown; head, in dorsal view, more strongly narrowed (Fig. 5); antennomere 3 broader and shorter than antennomere 4 (40: 46), length ratio of antennomeres 5–9 as 44: 38: 35: 32: 25 (Fig. 12); subgenital plate slightly longer than broad, apical margin subtruncate (Fig. 7); gonoforceps as shown in Fig. 15, harpe clearly longer than broad; penis valve as shown in Fig. 16, dorsal margin of valviceps with many minute teeth.

Host plants. Unknown.

Distribution. China (Zhejiang).

Etymology. The specific epithet "*tianmunica*" is derived from Mt. Tianmu in Zhejiang Province, where the type specimens were collected.

Strongylogaster xanthocera (Stephens, 1835)

Tenthredo xanthocera Stephens, 1835: 81.

Diagnosis. Female body length 11–13 mm. Body black, following parts yellow: labrum, antennomeres 1–2, most of antennomere 3, posterior margin of pronotum, tegula, posterior margins of abdominal terga 2–10, apex of hind femur, basal 1/3 of hind tibia; other parts of hind tibia, tarsomeres, stigma largely and frontal vein reddish-brown. Head strongly rugose, thorax coarsely punctured; postocellar area and temple with some shiny portions; posterior half of mesoscutellum, mesoscutellar appendage largely and frontal margin of mesepimeron smooth; all abdominal terga with dense microsculptures. Anterior margin of clypeus "V"-shaped, narrowed; interocellar furrow and postocellar furrow fine, postocellar area 2× broader than long, lateral furrow fine, malar space as wide as diameter of middle ocellus, antennae 2× not longer than breadth of head. Subapical tooth of claw slightly shorter than apical tooth. Fore wing without anal cross-vein, anal cell of hind wing sessile. Ovipositor sheath with large lateral branch, annuli of serrulae prominent. Male body length 8.5–10.5 mm, abdominal terga 1–2 black.

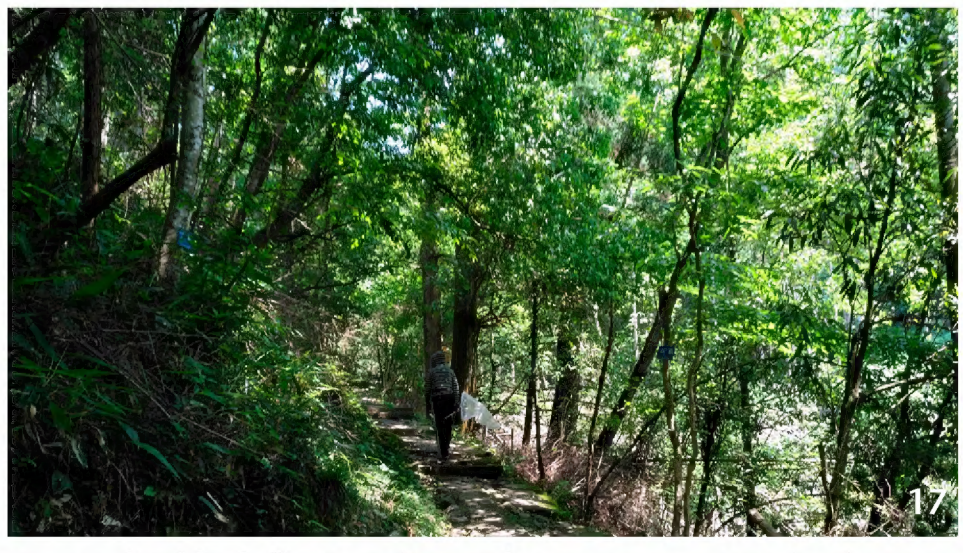
Material examined. 1 female, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Chanyuan Temple, 30.323°N, 119.442°E, 405 m, 3-IV-2018, leg. Zejian LI & Mengmeng LIU & Kaiwen GAO & Tingting Ji, ethyl acetate (LSAF18012); 1 male, China, Zhejiang Province, Lin'an District, Mt. Tianmu, Xianrending, 30.349°N, 119.424°E, 1506 m, 11-V-2018, leg. Zejian LI & Mengmeng LIU, ethyl acetate (LSAF18036); 1 male, China, Zhejiang Province, Longquan City, Mt. Fengyang, Datianping, 27°54'11"N, 119°10'33"E, 1410 m, 17-IV-2019, leg. Zejian LI & Xiufang LI, ethyl acetate (LSAF19012); 1 male, China, Zhejiang Province, Lishui City, Liandu District, Fengyuan Town, 28.195°N, 119.797°E, 1000 m, 22-IV-2019, leg. Zejian LI, ethyl acetate (LSAF19015).

Distribution. China (Anhui, Fujian, Hunan, Shaanxi, Zhejiang), Europe.

Host plant. *Pteridium aquilinum* (L.) Kuhn (Pteridaceae) (Liston 1995).

DISCUSSION

Five species of *Strongylogaster*, including the new species, are recorded from Zhejiang Province. Habitat photographs of the collecting sites of these five species are provided (Figs 17–18). According to data we have already obtained, there are more than 500 species of sawflies in Zhejiang. Mount Tianmu is the area with the highest diversity of sawflies. In Mt. Tianmu, Chanyuan Temple is apparently the most suitable habitat for collecting sawflies, with an altitude of about 400–500 m above sea level.



Figures 17–18. Collecting sites of *Strongylogaster* spp. in Zhejiang Province, China: (17) a site near Chanyuan Temple in Mt. Tianmu, Lin'an District, Hangzhou City; (18) a site near Datianping in Mt. Fengyang, Longquan City.

Mount Tianmu is the highest mountain in northern Zhejiang Province, where the highest peak is Xianrending (1,506 m above sea level). The subtropical deciduous-evergreen broad leaf forest vegetation of the mountain is well developed and has a very high biodiversity. A great number of new sawflies were found there in the past decades (for example, Shinohara and Wei 2016). Besides Mt. Tianmu, there are a lot of well forested mountainous regions in Zhejiang Province, especially the western and southern regions neighboring Jiangxi and Fujian mountainous areas. There are many gaps in field collecting in those regions till present. We guess that more species of *Strongylogaster* will be discovered from Zhejiang in future.

ACKNOWLEDGEMENTS

The authors are deeply grateful to the anonymous referees for valuable comments and suggestions. This research was supported by the National Natural Science Foundation of China (grants 31970447 and 31672344).

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Submitted: January 12, 2021
Accepted: May 31, 2021
Available online: June 25, 2021
Editorial responsibility: Gabriel L. F. Mejdalani

Author Contributions: ML, ZL and MW contributed equally to this article.
Competing Interests: The authors have declared that no competing interests exist.
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